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1. ON THE EVIDENCES OF THE ANTIQUITY OF MAN IN THE UNITED STATES. By Colonel Charles Whittlesey, of Cleveland, Ohio.

WITHIN the past five years remarkable developments have taken place in Europe connected with the antiquity of man; not less than a dozen books have been published upon the recent discoveries, most of which are written by men of learning, and show the results of their personal observations. The number of the relics of man thus brought to our notice is surprising. In the delta where the impetuous Tiniere discharges into the Lake of Geneva at Villeneuve, in Switzerland, Mr. Morlot has traced the successive occupants of that country from the Christian era back to the age of Stone.

The savans of Switzerland have discovered and explored large numbers of the habitations of a departed race, who built their domicils upon piles, in the shallow water of the lake near the shore, and who were also of the era of bronze, and stone implements. Retiring still farther from the historical epoch, the French and Belgian geologists and ethnologists have found, in the numerous bone caverns of those countries, utensils fabricated by men, and bones of the human race, under circumstances which have led these investigators to date their existence nearly or quite to the glacial period. These announcements by the continental explorers were received by the English geologists with astonishment, and in most cases with incredulity.

In 1863 the patience of the English investigators was nearly exhausted, by reports made by M. Boucher de Perthes, at Abbeville, on the banks of the Somme, that he had exhumed a human jaw from the superficial materials of that region. He had in 1837 and 1844 announced the discovery in the same beds at a depth of ten to twelve feet, of numerous wrought

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implements in flint, made from the silicious nodules of the chalk formation on which the Abbeville drift materials rest. During a quarter of a century these reports were generally discredited. M. Boucher dePerthes was not a man of science, but a gentleman of wealth and leisure, of high literary acquirements, with much French enthusiasm, and he had a theory to support. His brilliant general learning rather injured than improved his authority among those who pursue the exact sciences. He adhered to the doctrine that the flood of Noah extended over the earth, and that the knives and arrowheads in the drift of the Somme were the remains of generations which were destroyed by it. To find evidence in support of this belief, he pursued his investigations of the gravel beds around Abbeville, until one generation has passed away. His proofs were thus far only sufficient to convince a few personal friends of his own nation. His own life had passed the usual limit of human existence, yet the ardor of youth was in his case coupled with the perseverance of age.

A number of other fortunate circumstances combined to render his researches more thorough than any heretofore carried on in the drift materials. There is a canal in the valley of the Somme, which in one place gave a fresh section sixty feet in height. The railway from Bologna to Paris passes through Abbeville, and up the Somme.

For many years the common roads of Picardy have been made and repaired with the flint gravel of the drift beds, which was procured from numberless pits along the banks of the Somme.

The French government has built a large permanent fort near the residence of M. Boucher dePerthes, at Abbeville, in the ditches of which the same beds are exposed. M. dePerthes had for many years engaged the workmen upon all these improvements to search in the gravel for flint arrowheads, hatchets and splinters, by paying them a small sum for what they should find. He had also the good will of the Emperor, and consequently of the superintendents of the works. He spent much of his own time with the laborers in the pits, and had friends who did the same. His faith in the existence of human bones in the same beds where the flint implements were

found, never flagged, because he considered that he had himself seen decayed fragments of them ; not, however, perfect enough to announce to the world.

On the 28th of March, 1863, the great object of a long life was accomplished by the discovery in a pit at the wind-mill of Quignon, about seventy-five feet above the tidewater at Abbeville, of one-half of the lower human jaw, near which were some human teeth. During the year which followed, several other fragments of human bones were found in a similar situation, in a layer of gravel near the overlying chalk, at depths of ten to twelve feet. These were in close connection with the flint implements, but the human remains were so small, and with the exception of the teeth so much decayed, that the workmen very seldom noticed them. They had, moreover, a superstitious dread of human bones found in a position so mysterious, and therefore rather avoided, than sought them. Most of these remains were discovered by scientific collectors, who broke open with their hands the lumps of clay and sand of which they formed the nucleus, which the workmen had thrown into the spoil banks. It is evident that nothing short of the presentiment, the faith, and the enthusiasm of M. B. de Perthes, making the most of the most favorable circumstances, would have brought these relics to light. Without all these happy coincidences the discovery might not have been made during another century. His disclosures led to close investigations along the valley of the Somme, and the bluffs which border upon it, up the stream to and beyond Amiens, a distance of about thirty miles, the formations being everywhere the same. Hundreds of flint implements have been exhumed from the same gravel beds, on the French side of the channel, and on the English side, in formations precisely the same ; amounting in all to about (3000) *three thousand*.

As to the denial made by the principal English archæologists regarding the genuineness of the jaw described by M. de Perthes, I refer to the report of Milne-Edwards and others in the "Compte Rendus," from May, 1863, to July, 1864.

If we cannot rely upon statements supported by such an accumulation of proof as is there produced, we must refuse credence to most of the reported facts in relation to all other fossil remains.

AGE OF THE ABBEVILLE GRAVEL BEDS.

It may not be true that the superficial materials in which these remains are found, are of the same age as the North American drift. They are, however, the only stratified beds between the soil and the cretaceous strata in that region, and they occupy a very extensive region in France and England. These beds contain the fossil horse, ox, *Elephas primigenius*, and rhinoceros, and constitute what is known in Western Europe, by the name of diluvium. It is quite probable that those wide spread diluvial layers belong to a modified condition of the drift materials, corresponding to what we observe here in large valleys near the southerly border of the boulder drift. As the glacial period drew towards a close, the intervention of ice as a transporting agent became less, and that of water greater. The European diluvium probably belongs to the later phase of this era.

Some explorers detect the action of large floes of ice, in the movement of blocks belonging to strata foreign to the region; but most of the materials are of local origin, belonging to the valleys of the present streams. In general, the mammalian remains are the same as in the drift of the United States. Along the great valleys of Western Europe, such as the Seine, the Rhone, and the Rhine, the loess is a conspicuous member, generally the upper one. It is the same in the valley of the Missouri, the Mississippi and the Ohio. The European diluvium is a fresh-water deposit, like that of the western and north-western drift deposits, on the waters of the lakes and the Mississippi. It embraces, like our drift beds, many varieties of timber and vegetables which are more northern than the present vegetation. The fresh-water and land shells which are embraced in the superficial materials here and in Western Europe, are almost identical. So many resemblances go far to establish a geological parallelism.

Mr. Lyell inclines to the opinion that the flint bearing beds of Amiens and Abbeville are more ancient than the bone layers at Natchez, Mississippi, which are at the bottom of the loess.

Whatever may be the exact order of arrangement, there is a general synchronism between the post-tertiary or quaternary

system of Europe and the United States, and since human relics have certainly been found in this formation in the old world, it is reasonable to expect them here. If human bones exist in our northern drift or in the modified river valley deposits of the terrace period, generations may pass before they are discovered. Flint and stone implements are imperishable, but the osseous parts of animals and men are dissolved by chemical action. In beds of such great antiquity, historically considered, as the lower quaternary, very little is preserved except the teeth. Such discoveries must, therefore, be due in this country, principally to accident, and not to research.

We cannot expect to have the concurrent aid of an enthusiast like M. Boucher de Perthes, a government ready to assist, and thousands of workmen turning over the earth, in which such revelations may be expected.

ANTIQUITY OF THE NORTH AMERICAN RED MAN.

It is a little more than three hundred years since the Spaniards landed on the shores of the Gulf of Mexico, where they found the red man, in every respect the same as he is now, among the southern tribes of the United States. If we can credit the historical literature of Iceland, the Northmen were on the coast of New England about the year 1000, where they met a savage people, apparently the same as our forefathers encountered there six hundred years later. The same tribes of Indians, remnants of whom have survived to our day, were seen during the previous one hundred years on the St. Lawrence and the Atlantic coasts, by Jacques Cartier, Americus Vesputius, Verrezani and the Cabots.

By historical proofs that are now regarded as worthy of credit, we can thus trace the North American Indian, as a resident in the territory of the United States, backward more than eight centuries and a half. In this as in all countries there are found the remains of a people more ancient than any written record.

The North American Indian has always occupied a position so low, in comparison with other races, that permanent monuments of his presence are very rare. If he had disappeared before the advent of an historical race, no certain traces of his

existence would have been found. His tenements were temporary shelters, which he carried from place to place. The mounds he raised over the dead were low, and contained relics of which the most that can be said is they belonged to a people in the rudest state of barbarism. Where he cultivated the soil, it was in a manner so slight that a few centuries of time obliterated the evidences of it. The scattered inscriptions and effigies which he cut upon trees and stones had no meaning to any one but himself. His tools and implements had no special characteristics to distinguish them from those of any other savage people in the lowest scale of development. Since the historical period in North America he has remained precisely the same, without progress towards civilization, and therefore it may be inferred that his condition in previous centuries while an inhabitant of this country was a fixed one. He could not have descended much lower, and he has left no evidences of an advance. The effect of this fixedness of condition is to render the deductions of craniologists of more value than they would be in the case of a people whose mode of living, whose thoughts, occupations, dress, religion, intelligence, food, and general surroundings were subject to change, especially in the direction of progress.

How long have they been in the occupation of North America, and how can we determine the period?

The antiquarians of Europe regard those ancient people who used *flint implements*, as having been prior to those who had implements of *stone*, and the latter as being older than the races who had the use of bronze, or other metals, especially iron. In the United States the race next prior to the white one, had very few implements of stone. Their knives and arrowheads, their war implements, and their agricultural tools, were almost entirely of flint.

They had a very few and very rude cutting instruments of native copper; possessing at the same time in a certain degree, implements of the flint, the stone and the metal era of Europe, the flint greatly predominating. The mound builders, who preceded the race of red men, produced and used tools in the reverse order. Their *stone* axes, adzes and mauls, were very numerous, *copper* tools plenty, and those of *flint* very rare.

In their case the most ancient people were the most industrious, and cultivated the soil, possessed more mechanical ingenuity, and left more prominent monuments, which in the course of nature will never perish.

The difference between the relics of the mound builders and the Indians is so great that there is little difficulty in deciding between them.

On the Atlantic coast, from Nova Scotia to Florida, there are numerous refuse heaps of sea-shells, which are almost identical with the ancient shellheaps of Sweden, Norway and Denmark, known in those countries as "Kjækkenmæddings."

Those of the Eastern and Southern States, have been examined by Mr. Jones, of Halifax, Professor Wyman and others, who regard them as the work of the North American Indians. On one of the shell mounds of Florida, situated on the river St. Johns, there grew an oak, which was five hundred and fifty years old. There are very ancient shell mounds on the Tennessee River, between Chattenooga and the "Muscle Shoals," but they have not been thoroughly explored. I have also seen them on the Wabash in Indiana, near New Harmony. The American shellheaps, like those of Scandinavia, contain stone and flint implements mingled with charcoal, and the bones of animals, fishes, birds and reptiles, now or recently living in the vicinity. Only one small bone of man has been found in the American kitchen-muddins.* They have neither the size or the marks of antiquity, which the Danish shellheaps exhibit but are some of them so ancient that changes of climate and of vegetation have occurred while they were being formed. The shellheaps, therefore, as at present known, give us very little information in regard to the antiquity of the red man.

But there are remains of the same race in bone caves, and rock shelters, which bear directly upon this question, to which I will call your attention.

* Since this paper was read, a human *underjaw*, with teeth, has been found by Prof. S. F. Baird, at the Shellheap on Eagle Hill, Ipswich, Mass. For an account of this and other Shellheaps in New England, see Prof. Wyman's articles in the "American Naturalist," Vol. I. Later investigations than those reported by Prof. Wyman have shown the deposit at Eagle Hill to be much larger and deeper than was at first supposed.—EDITOR.

ELYRIA SHELTER CAVE.

Examined in April, 1851, by Dr. E. W. Hubbard, Professor J. Brainerd, and Charles Whittlesey.

This is one of numerous instances where the "grindstone grit" of northern Ohio, resting upon soft shale, presents a projecting edge, forming a grotto capable of sheltering a large number of persons, being about fifty feet in length, by fifteen feet broad. This and others in the vicinity which have not been explored, correspond to the European "shelter cavern," where human remains are always found. These retreats constituted the domicils of our race, while in their rudest condition. We dug to a depth of *four feet* on the floor of this cave, composed of charcoal, ashes, and bones of the wolf, bear, deer, rabbit, squirrels, fishes, snakes and birds; all of which existed in this region when it became known to the whites. The place was thoroughly protected against rains. At the bottom, lying extended upon clean yellow sand, their heads to the rear and feet outwards, were parts of *three* human skeletons; two of them nearly entire. Two of the skulls were preserved by Prof. Brainerd. They were decided to belong to the North American race of red men, by those who had an opportunity to examine them. These skulls were exhibited at the Cincinnati Meeting of the American Association in 1851, but were afterwards destroyed by a mob, together with the entire Museum of the Homœopathic College, at Cleveland. The position of the skeletons indicated that they were crushed by a large slab of the overhanging sandstone falling upon the party, while they were asleep at the back part of the grotto. One of the skulls was that of an old woman, the other of a young man. Flint arrowheads such as the Indians once used, were scattered throughout this mass of animal remains.

This cave may be found on the west bank of Black River, a short distance below the forks, at the town of Elyria, Ohio, in a romantic gorge, through which the river flows. Judging from the appearance of the bones, and the depth of the accumulations over them, two thousand years may have elapsed since the human skeletons were laid on the floor of this cave.

HUMAN REMAINS IN A CAVE NEAR LOUISVILLE, KENTUCKY.

T. R. Scowden, C. E., 1853.

In constructing the reservoir for the Louisville water-works, on the bluffs of the Ohio, two miles above the city, the Engineer, T. R. Scowden, Esq., discovered a cave in which were a large number of human bones. It is forty feet from a mural face of lime-rock of the Upper Silurian epoch, which is known in Kentucky as the "cavernous limestone." The elevation of the bluff is about one hundred and twenty-six feet above low water in the river, and ninety feet above the bottom lands, which are half a mile wide in front of the water-works. It is probable the cave is an extensive one. No outlet is known, and when water was directed into it, no place of discharge was discovered. As far as it was explored the opening was not large. It had a direction downward and to the rear, but was so much infested with rattlesnakes that no one could be induced to examine it. On the rock there was ten feet of the loess like loam of the country, in which was a depression, into which the surface water settled, such as in that region are called sinks. The bones, a box of which were preserved by Mr. Scowden, were cemented into a breccia, by calcareous drippings from above. In one mass there are portions of six human crania, but none of them large enough to be of value in the comparison of races. There are other bones and teeth, representing more than that number of persons, which are in a good state of preservation. The opening in the rocks at the top of the cave, which was closed by a loamy clay, was not as large as the cavern, the roof of which was twelve feet below the surface of the lime-rock. From the roof there were the usual pendant concretions, known as stalactites. In shape this part of the cave was a dome, six feet across at the base, and about five feet high, the bones lying in a confused heap on the floor. The downward passage into which the water flowed was situated at the rear, and its direction was away from the bluff. A stone axe and a pestle were found with the bones; also a flint arrowhead. Below the cliff there was an ancient Indian burying ground, in which many graves and human bones were exposed while digging the trench for the main inlet pipe of the water-works.

The bodies may have been introduced for burial, through a distant entrance not yet discovered, or there may have been a time when the cave was open above. They were evidently of the Indian race, and the place was a sepulchre. Among the Hurons who lived between Lake Ontario and Lake Huron, when the French missionaries were there, two centuries since, there was a practice of collecting, from time to time, the bones of their dead from all the graves of the tribe. They were then placed in a pit, without order, and covered in the presence of all the people, consecrated with funeral ceremonies and lamentations. The cavity or sink in the earth, at Louisville, would constitute a burial pit already made, or partially made; and after the bones were deposited, they could have been easily covered. From the quantity of tufa formed on the roof and over the bones on the floor, it is evident that a long period has elapsed since they were deposited—full as long as in the case of the Elyria grotto, or say two thousand years.

HIGH ROCK SPRING, SARATOGA, NEW YORK.

Profile by Dr. Henry McGuire, 1866.

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|---|------------|
| 1. Muck and tufa on which the cone rested | 7 feet. |
| 2. Tufa | 2 " |
| 3. Vegetable muck, on the surface of which lay a pine tree, with one hundred and thirty annual layers of growth, worn by the feet of persons, probably Indians, | not given. |
| 4. Calcareous tufa, same as No. 2 | 3 feet. |

Chancellor Walworth states, that in 1825 he saw at St. Regis, New York, an old Mohawk, by the name of Loren Tarbel, who said the water did not flow over the cone when he was a boy.

The estimates made by Dr. McGuire, of the time occupied in the formation of the tufa, which showed twenty-five layers to the inch, is, for five feet, fifteen hundred years.

Rate of formation of the rock cone, eighty years to the inch, is, for four feet, equal three thousand eight hundred and forty years (probably too large). For the accumulation of muck, five hundred and ten years (which is probably too small). Total, five thousand eight hundred and forty years. The pine tree

worn smooth by the feet of men, beneath the upper bed of tufa, must have been there at least one thousand years before the formation of the rock cone.*

Mr. Koch, who furnished a skeleton of the *Mastodon Ohioensis*, from the recent alluvium of the Pomme de terre River, Mo., to the British Museum at London, convinced the English geologists, that he found a flint arrowhead at the depth of fifteen feet beneath the skeleton, which arrowhead was of the pattern used by the North American Indians. He also stated that near the skeleton, and full as deep, were three other flint arrowheads. If these statements are reliable, they tend to extend the antiquity of the occupation of red men much beyond that of the American shellheaps, in which are no remains of extinct animals. This statement of Mr. Koch, is, however, contradicted by one of the men who assisted him in exhuming the skeleton. A similar case is presented by Dr. Holmes of Charleston, S. C., in the "Proceedings of the Philadelphia Academy of Natural Sciences," for July, 1859. He found pottery at the base of a peat bog, on the banks of the Ashley River, in close connection with the grinder of a mastodon.

This pottery probably belonged to the red man, and if so, strengthens the proof of his presence here before the horse, mammoth and mastodon were extinguished.

A PEOPLE BETWEEN THE INDIANS AND THE MOUND BUILDERS.

The ancient earthworks which abound on the waters of the Ohio do not extend northward to Lake Erie. There is a belt of country north of Central Ohio, near the water shed of the streams that empty into the Lake, which is without ancient works, so far as at present known. On all the rivers discharging into Lakes Erie and Ontario from the South, there are ancient forts in profusion, but they are of a type entirely different from those in the valley of the Ohio, which extend southward through Kentucky, Tennessee and Texas, into Mexico.

*Dr. McGuire has republished an account of this excavation at High Rock Spring, in the "Proceedings of the Boston Society of Natural History," Vol. xii, p. 398 (May, 1869), more in detail than the above, but giving nearly the same total result (5470 years, within all bounds). He also mentions the finding of a fire-place and charcoal on the clay bed, under a stratum of muck 2 feet thick, underlying the last 3 feet of tufa mentioned above.—EDITOR.

There are few mounds and no pyramids or rectangles on the shores of these lakes, but hundreds of small irregular fortifications of earth. They are always located in places which have natural strength, such as bluffs and points of land with water near by, and steep ravines on two or more sides. Generally the fort consists of a ditch or ditches, and embankments across the narrow part of a peninsula. They are almost without exception well selected strongholds, judiciously fortified, and have the appearance of long occupation. The people who occupied these forts doubtless comprised not merely soldiers, but the entire population of the country. They must have been cultivators of the soil, but divided into hostile clans, like the old Scots and Germans, who required castles as a defence against each other. This race of fort builders on the lakes may have been contemporaries of the mound builders, and of the effigy builders of Wisconsin; but they were of prior date to the Indian, who has no more knowledge of the origin of these forts than of the mounds, and who had no earthworks when the whites first encountered them. Mr. Squier in his "Antiquities of Western New York," attributes them to the Indians, but upon grounds that do not seem to me sufficient.

I introduce this intermediate, or if not intermediate, distinct race, as the basis of future investigation; but do not feel warranted at present, in using it to increase the antiquity of the American man. I confine myself to the red men, the mound builders, and to the evidence of fossil men, contemporary with the elephant, mastodon, horse megalonyx, and other mammalia of the quaternary.

THE RACE OF THE MOUNDS.

The difference in their modes of burial, indicates clearly that the mound builders were a people distinct from the North American Indians. In almost every ancient burial mound, the remains of both races have been interred; the bodies of the most ancient at the bottom, or at great depths, on charcoal hearths, in rude enclosures of wood or stone, with copper ornaments, implements, wrought shells, coarse cloths, and other peculiar marks. On the sides of the same mounds, some of which are seventy feet in height, are the skeletons of the

red race, at shallow depths, with no attempt at stone or wooden coffins, and in the early graves no metal ornaments. In the sepulchres of the mound builders, flint knives are rare, and flint arrowheads still more so; but stone axes are not uncommon. In the Indian graves are numerous flint arrowheads and knives, but stone implements, except pipes, are very rare. The Indian has nowhere raised conspicuous earth mounds over his dead. Their most notable monuments, are low stone-heaps, like the Irish cairns, formed gradually by the friends and admirers of the deceased, as they pass the spot, throwing a small boulder upon it. In the Indian graves are no evidences that the body was burned, as there are in large numbers of the old earthen *tumuli*. No instance is reported where an earth mound has beneath it the remains of a race which might be more ancient, but the instances are numerous where there are bones of the mound builders beneath those of the red man.

The mound builders show in all their relics and their work, a greater mechanical skill, more intelligence, industry, and perseverance, than the Indian tribes ever possessed. They wrought the copper mines of Lake Superior very extensively for the purpose of fabricating tools of this metal, which are found in their mounds, in contact with their skeletons. The Indians had only the rudest copper implements, and these were of a pattern quite different from those discovered in the mounds. It was a very rare circumstance that the French missionaries found among them copper that had been wrought. It was generally treasured up as a manitou, in the original form of a nugget, and transmitted as an heirloom from generation to generation. The copper adzes, axes, chisels, spades and spearheads, of the mound builders, were nowhere found in use among the living tribes, nor any tools having the same degree of finish, or intended for purposes of so high civilization. They had only the rudest knives, arrowpoints, and implements for curing skins.

These facts sufficiently attest the presence of different races, and at a different period; the builders of temples and burial mounds being the predecessors of those who constructed no monuments or fortifications of earth. We must also infer that

a people sufficiently numerous to work the mines of Lake Superior throughout the copper region, and to construct works such as those at Newark, Marietta, Circleville, Portsmouth and Cincinnati, must have been permanent occupants; but how shall we determine the length of this period of occupation.

After examining the principal works of the mound period, in Ohio, and their mine works on Lake Superior, I could not estimate the period of their occupation at less than one thousand years, with a strong probability in favor of two thousand. If we drop for the present the supposition of an intermediate race, and take the highest estimates for the occupation of the red man and the mound builders, we have only four thousand years, which does not carry us back to the beginning of the historical period, in Asia and Africa.

In Switzerland, relics of man in the recent alluvium attest his presence there, according to M. Morlot, nine thousand to eleven thousand years, or beyond the historical records of the old world several thousand years. It is highly probable, and is in accordance with the analogies of Europe, that since the glacial period, there was a people here, more ancient than the mound builders, but I know of no remains of such a people, except the charcoal beds at Portsmouth, Ohio, in the ancient valley alluvium. The whelk, found by Mr. Cleveland, is a shell which was in common use by the mound builders. The alluvium in which it was embedded, is of the most recent kind, which at the mouths of the tributaries of the Ohio, forms very rapidly. At the mouth of the Great Miami, the mud deposited from back water in a single flood of the Ohio River is sometimes several inches in thickness. Since the settlement there in 1789, the stumps of trees and large logs have been covered up in this way, until the plough now passes over them. This modern alluvium is easily distinguishable from the ancient river alluvium, which is derived from the drift materials, and which must also be distinguished from deposits of the terrace period, known in Ohio as the valley or modified drift. The terrace period represents the closing phase of the glacial era, when the valleys were full of water and floating ice, sorting the materials on a broad scale, in lines parallel with the streams. The ancient river alluvium is due wholly to the currents of

streams acting upon the valley drift of the terrace period, at levels higher than the present channels.

In both these deposits the elephant and mastodon are common, as well as in the recent alluvium. In the ancient river alluvium has been found the gigantic beaver, or *Castoroides Ohioensis* of Nashport, Ohio, the taperoid jaw of Yellow Creek, Columbiana County, Ohio, and probably the *Bos bombifrons* of Trumbull County, Ohio.

There is, therefore, a long period of time to be accounted for between the earliest mound builders in this country, and the earliest inhabitants of the Swiss Lakes and of the Nile.

Since the close of the terrace period there has been no material change in the surface of Ohio, and perhaps no general change in the climate. Man could have resided here then as well as now. In Belgium and France relics of man extend much farther back, into and even beyond the terrace period, when the surface of the country was somewhat different from what it is now. He lived, and may have perished, with the elephant, mastodon, rhinoceros, and the extinct elk, during the closing portions of the ice period. It is therefore reasonable to suspect that man existed in North America with the extinct elephant, mastodon, megalonyx, horse, beaver, and the peccary of the United States, which lived towards the close of the ice era, though it does not follow that they, and he, were exactly cotemporary here with the European species.

With the exercise of the same never tiring research displayed by M. dePerthes, and the same facilities, it is highly probable that the drift clays of Lake Erie, and the valley of the St. Lawrence, would furnish us with equally palpable specimens of the ancient man.

EVIDENCES OF MEN MORE ANCIENT THAN THE MOUND BUILDERS.

In 1838 while examining the structure of the fluvial deposits on the Ohio River, at Portsmouth, Ohio, I saw in two places in the east part of that town, the remains of very ancient fires.

At low water, and thence up to a height of twelve and fifteen feet, is a bed of sand and transported gravel, containing pebbles of quartz, granite, sandstone and limestone, derived partly from

the adjacent carboniferous and Devonian rocks, and partly from the northern drift, the upper part much the coarsest.

On this is a layer of blue quicksand, from one to five feet thick, in which is a timber bed, including large numbers of the trunks, branches, stumps and leaves of trees, such as are now growing on the Ohio, principally birch, black-ash, oak and hickory.

Over the dirt bed is the usual loamy yellow brick-clay of the valley, fifteen to thirty feet in thickness, on which are very extensive works of the mound builders. In and near the bottom of this undisturbed homogeneous river loam, I saw two places where fires had been built on a circular collection of small stones, a part of which were then embedded in the bank.

The stones were colored red by heat, and among them was charcoal, covered by the clay, of which I have specimens. Around and near to the fire beds, were what appeared to be the exterior membrane-like covering of river shells (unios), but no shells. It was several rods from one of the charcoal beds to the other, and they were not precisely on the same level. They were from eighteen to twenty feet above low water, and about fifteen feet beneath the surface. There are no trunks of trees in the loamy brick clay which is not laminated. It was reported that some of the trees in the blue stratum below had been charred. On the surface of the clay deposits near the fire beds were two parallels, portions of ancient earthworks extending to the river. At the west end of the town—where an artificial mouth of the Scioto was formed, about thirty-five feet deep, in order to allow the Ohio canal to enter the river—the blue quicksand bed and the loam above it dips westerly down to the level of low water. To the westward of this artificial mouth the recent alluvium of the Scioto overlies the yellow loamy clay, cutting off both the quicksand and the loam. The Scioto alluvium has a darker color, is frequently contorted and laminated, and has embedded leaves and branches of trees now growing on its banks.

Francis Cleveland, Esq., an engineer upon the State works, who, in 1828, had charge of the deep cut, informed me that at a depth of twenty-five feet in this alluvium several conch shells were taken out, which were five to eight inches in length. He

said they were the same as one I then exhibited to him, procured from an ancient mound on the Scioto River, and which Professor Kirtland determined to be a *Pyrula perversa* from the Gulf of Mexico and Chesapeake Bay, and called whelks. These shells were in common use by the mound builders, probably in their public ceremonies.

Here we have within the limits of the city of Portsmouth, memorials of the mound period, and, as I conceive, of the rude fires of men of still higher antiquity.

REPUTED EVIDENCES OF MAN IN THE QUATERNARY.

Profile of the Mississippi River Bluffs, at Natchez, Mississippi, by Professor C. S. Forshey, 1842.

1. At low water mark, slate, thickness unknown, probably cretaceous, . . . 5 feet.
2. Recent conglomerate, probably quaternary, 8 " = 13 feet.
3. Coarse gray water-washed sand, quaternary, (high water mark at 40 feet), . . . 115 " = 128 "
4. Yellowish brown homogeneous calcareous loam, with fresh-water and land shells, the equivalent of the loess of the Rhine, 50 " = 178 "

On the surface of the sand, the skeleton of a mastodon was found, which appeared to have been buried erect.

Sir Charles Lyell in 1847 (*Antiquity of Man*, p. 200), collected at this place twenty species of *Helix*, *Heliciana*, *Pupa Cyclostoma*, *Achatina* and *Succinea*. And in the marly layers *Lymnea*, *Planorbis*, *Paludina*, *Physa* and *Cyclas*.

A narrow gully called the "Mammoth Ravine," near Natchez, originated in the convulsions of the earthquake of 1811, is seven miles long and sixty feet deep.

The *Mastodon Ohioensis* in the bed next below the loess was found in connection with the horse, *Bos*, *Megalonyx*, and other mammals.

Among these bones Dr. Dickson found the pelvic bone of a man. It was colored black, like the other bones of this bed, but so are the recent bones of Indian graves in the neighborhood. The superficial materials of the Somme in Picardy may be older than the Natchez bone bed, but there is not reliable evidence that Dr. Dickson's *os innomanatum* belongs to this

bed. It is a case open to investigation without prejudice, like the early discoveries of Boucher dePerthes.

Sir Charles Lyell's profile at Vicksburg, Mississippi, eighty miles north of Natchez, 1846.

1. Below low water, cretaceous.
2. Sand-bed with rolled pebbles, same as at Natchez. [This he regards as Eocene tertiary, but possibly drift. No tertiary has been reported by American geologists along the river above Vicksburg.]
3. Calcareous loam or loess, same as at Natchez.
4. Soil.

The loam, or loess of the Mississippi, has since 1846 been traced by Professors Safford, Owen, Swallow and Worthen, from Vicksburg to the mouth of the Missouri, and up the Ohio beyond the Wabash, where it contains the *Megalonyx*.

WORKS OF ART, GRINNELL LEADS, KANSAS.

An instance is given by Professor Daniel Wilson (*Prehistoric Man*, p. 46) of a flint knife, found at the Grinnell leads, Kansas, by Mr. P. A. Scott, at the depth of fourteen feet. It is probable that this knife belonged to some of our Indian races, with whom flint implements predominated, but how ancient the overlying deposits are, cannot be considered as well settled.

There is, however, a case given, upon the authority of Professor Agassiz, where the jaws, teeth and bones of the human frame were found by Count Pourtales in a calcareous conglomerate in Florida, which is geologically recent, but which they consider required ten thousand years to accumulate over the bones.* As no opinion is given as to the race to which these remains belong they cannot be connected with either the red man, or the mound builder. They may be parts of a skeleton, drifted from far distant lands, especially from the islands which constitute the West Indies. Unfortunately there is not only in this but in all the cases quoted in the United States, per-

*Count Pourtales, in reference to several erroneous accounts that have been given regarding the Florida bones, makes the following statement in the "*American Naturalist*," Vol. ii, p. 443 (Oct., 1868). "The human jaw and other bones, found in Florida by myself in 1848, were not in a coral formation, but in a fresh-water sandstone on the shore of Lake Monroe, associated with fresh-water shells of species still living in the lake (*Paludina*, *Ampularia*, etc.). No date can be assigned to the formation of that deposit, at least from present observation." — EDITOR.

taining to the quaternary period, a degree of uncertainty in the evidence, which is fatal to a scientific result.

The human skeleton described by Dr. Dowlais, found at the depth of (16) sixteen feet in the city of New Orleans, to which a high antiquity has been ascribed, belongs, according to the later investigations of Professor Hilgard, of the survey of Louisiana, to the recent alluvium.

While the canal around a rapid of the St. Lawrence was being excavated near Brockville in Canada, Dr. J. Raynolds of that place procured several copper tools, which are reputed to have been found (14) fourteen feet below the surface (Smithsonian Contributions, vol. x, p. 208). There were at the same depth a number of human skeletons, placed there evidently, according to some form of sepulture. The copper spearheads found among these skeletons correspond in their general characters to those of the mound builders, except in the mode of attachment to the shaft. In the Brockville spears there is a pointed spike or shank, instead of the usual hollow socket. There was also a spade-like tool of copper, of which none have been found in the mounds, but I have seen one from the drift gravel of Lake Superior closely resembling it. Neither have the copper spearheads, attributed to the mound builders, been found at such depths in their works as to render it certain they were made and used by them. The age of the Canada formation is not determined, but appears to be of the later drift, or terrace period, and the remains may have received a part of their covering from the alluvial wash of higher lands, or from slides. This locality requires farther examination.

On the Ashley river, near Charleston, South Carolina, Dr. Holmes reports an instance where he discovered fragments of pottery at the bottom of a peat-bog, in close connection with remains of the Mastodon and Megatherium (Proceedings of the Philadelphia Academy of Natural Sciences, July, 1859). There is here a close resemblance to the pottery finds of the deposits of the Nile, and the relics of the peat bogs at Abbeville in France. There is in them evidence of high antiquity, not, however, carrying us beyond the alluvium.

As the pendant or "plumb bob" of Sienite procured by Professor Grimes at the depth of (30) thirty feet below the present surface, in the bed of an ancient lake in California, will doubt-

less receive a notice in these "Proceedings," from Colonel Foster, I make no farther reference to it than to call attention to the fact that the deposit must be regarded as more recent than the drift. Mr. John Collot, of Vermilion County, Illinois, has in his possession a similar ornament or implement three inches long, made with great care and symmetry from a piece of pure crystalline specular iron ore. He has also a fragment of another precisely like the above, and a beautifully formed hemisphere, like a paper weight, fabricated of the same material. They were found on the surface about fifteen miles south of Covington, Indiana.

Near Perryville, in Knox County, Ohio, about twenty years since, I. N. Pillsbury, Esq., Civil Engineer, of Cleveland, Ohio, discovered a "plumb bob," very like the Sienitic one of California. It was taken by him about one foot beneath the surface, within one of the ancient forts common in Ohio. The material is a whitish gray crystalline limestone, not as elegant in form as those of Mr. Collot and Professor Grimes, but about the same length.

In all of them, the hole at the upper end through which they were suspended, tapers towards the centre. It is more likely they were amulets or ornaments worn about the person, and are of an era subsequent to the mound builders.

In this epitome of the evidences of man in the United States prior to the historical period, I have not alluded to the reputed skulls of Calaveras County, California, produced respectively by Professors Whitney and Blake. In regard to both of them there is a direct contradiction in reference to the authenticity of the relics, and the age of the deposits in which they are supposed to have been found. These "Proceedings" will no doubt contain their views and their proofs at full length. In every instance where we descend below the alluvium in search of human remains and relics we are thus far met by conflicting testimony as to the facts.

The later clay, sand and gravel beds of the drift era on the lakes, and the newer drift and loess beds of the Mississippi, should contain them, if these deposits are, as they appear to be, coeval with those of the Somme. In the Belgian caves we are also furnished with works of man that seem to be as ancient as the closing out of the glacial period.

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